

# Novel way of defining transitioning galaxies

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Young/Blue/Dusty (A)      Young/Blue/Dustless (B)

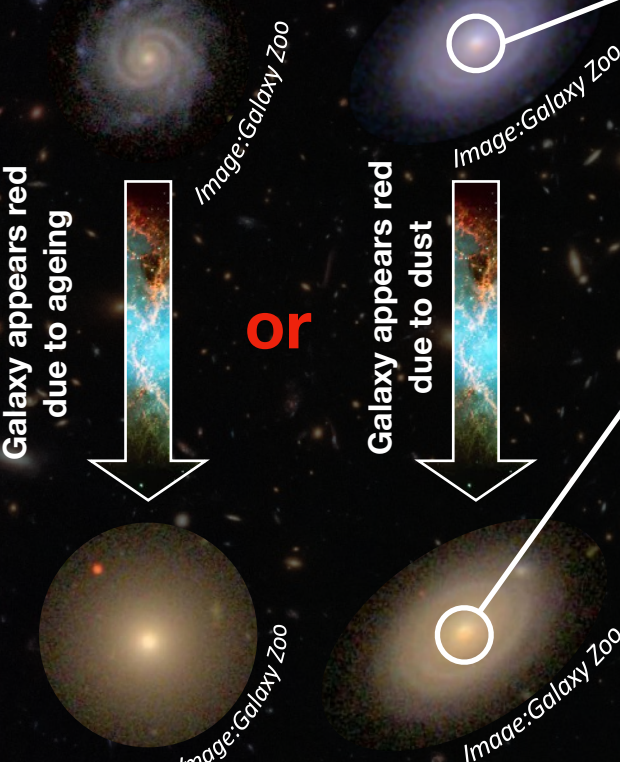
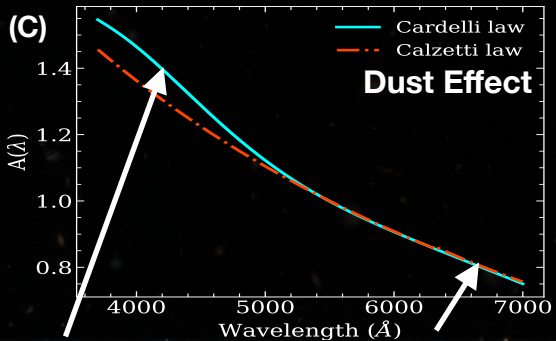
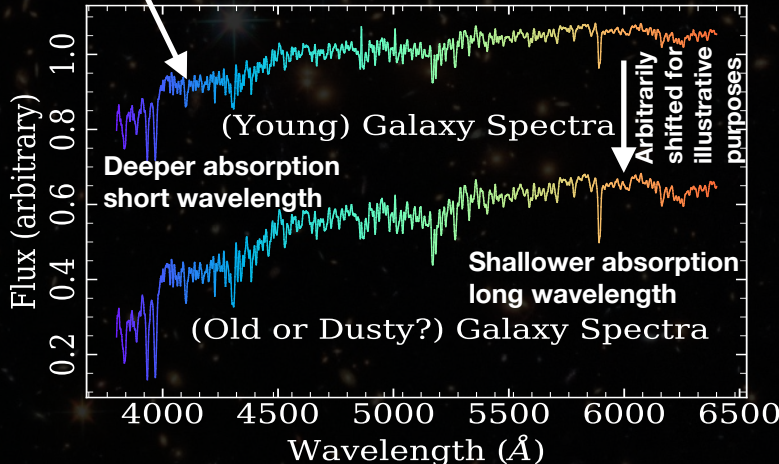


Image: ESA/Hubble



High absorption of blue light.  
 Low absorption of red light.  
 Effect translated unto spectra.  
 Dust correction sensitive to spectral interval.  
 Dust effect on spectra similar to ageing.

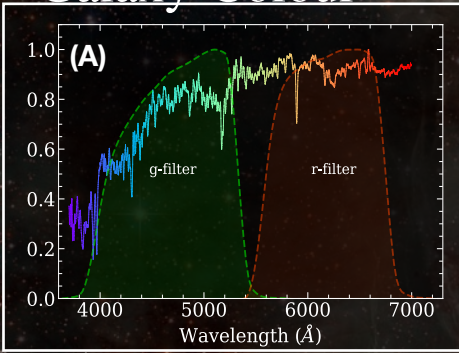


Angthopo J., Ferreras I., Silk J., 2019, MNRAS, 488, L99-L103  
 Angthopo J., Ferreras I., Silk J., 2020, MNRAS, 495, 2720-2737  
 Angthopo J., Negri A., Ferreras I., de la Rosa I. G.,  
 Dalla Vecchia C., Pillepich A., (In prep.)

# Galaxy Distribution

Image: ESA/Hubble

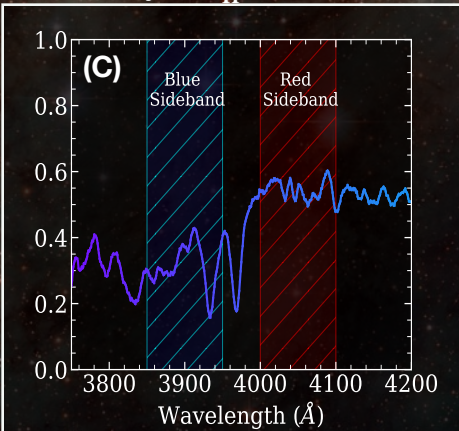
## Galaxy Colour



Colour: strongly affected by dust

$$\text{colour} = g_{\text{mag}} - r_{\text{mag}}$$

## Galaxy $D_n(4000)$

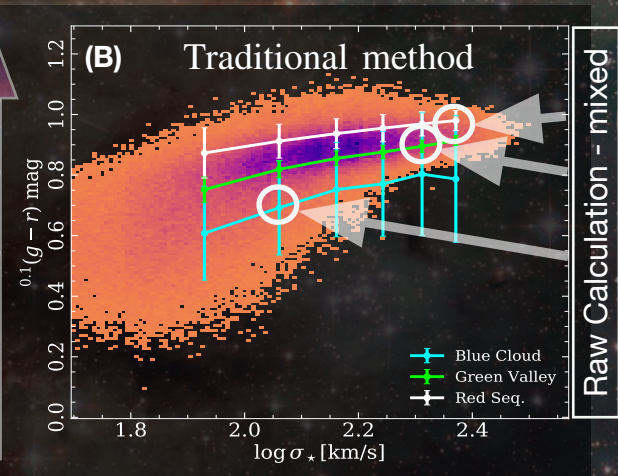


$D_n(4000)$ : weakly affected by dust

$$D_n(4000) = f_{\text{red}}(\lambda) / f_{\text{blue}}(\lambda)$$

Increase in age of galaxy

Increase in age of galaxy

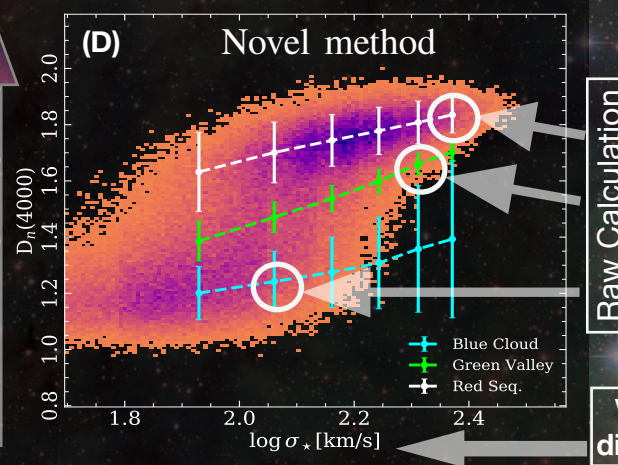


Raw Calculation - mixed

Images: ESA/Hubble and Galaxy zoo

Modelling - Dust correction = clean

Galaxy distribution of Sloan Digital Sky Survey



Raw Calculation = clean

Velocity dispersion



# Observation (SDSS) VS Simulation (EAGLE)

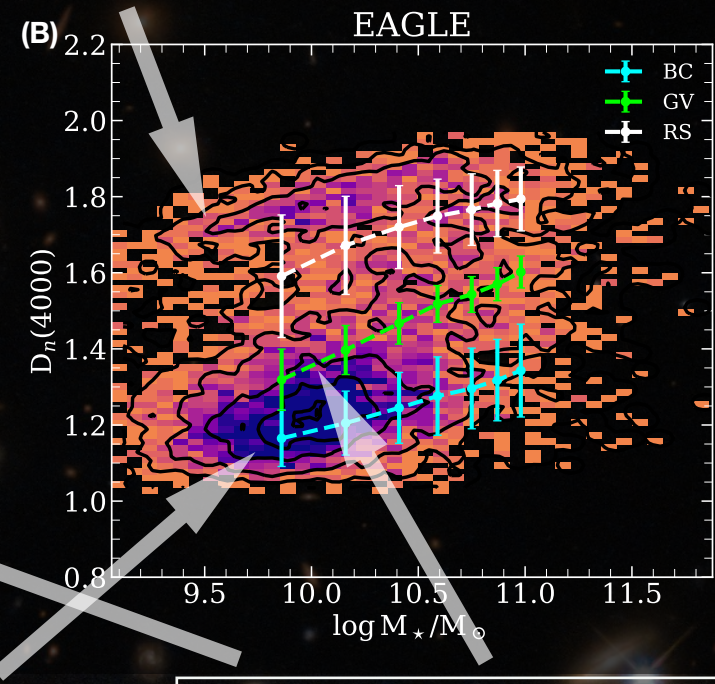
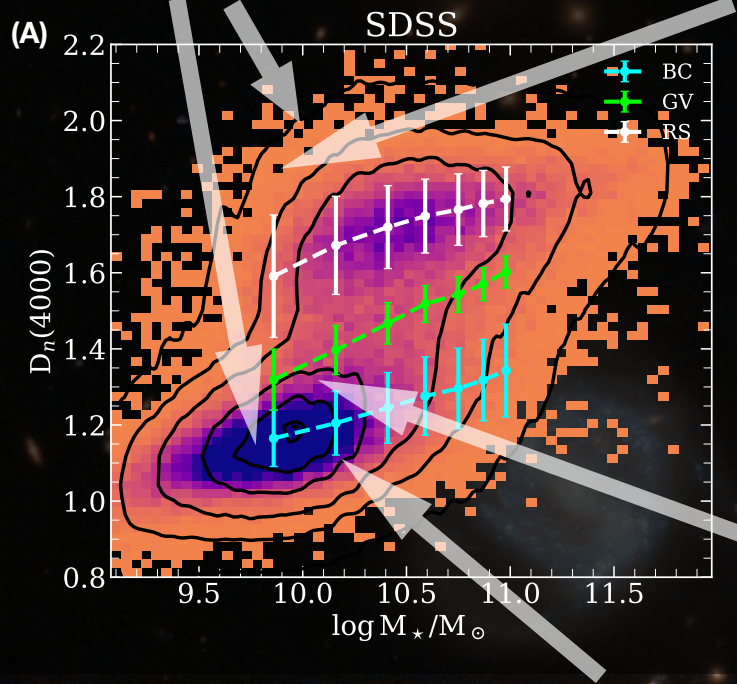
Image: ESA/Hubble

Does EAGLE overproduce low mass red galaxies or SDSS miss these galaxies?

Galaxy densities:  
Purple regions indicate high density,  
orange regions indicate low density

Simulation shows more galaxies  
in Red Sequence (RS) than  
observation at low mass .

Simulation has RS which is  
at higher  $D_n(4000)$  value  
than seen in SDSS.



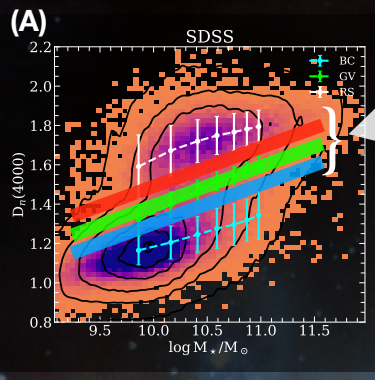
Blue cloud (BC) area in simulation is at a slightly higher  $D_n(4000)$  value than seen in SDSS. Thus youngest galaxies in EAGLE slightly older than observed.

Relatively low density of galaxies for SDSS at GV. EAGLE simulation shows higher density in same region.

# Galaxy Type Fraction

Image: ESA/Hubble

Over production of SF galaxies at low mass but under production at high mass in EAGLE.



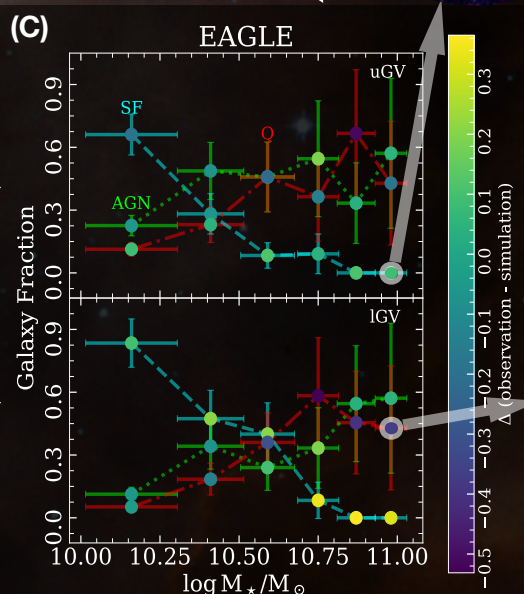
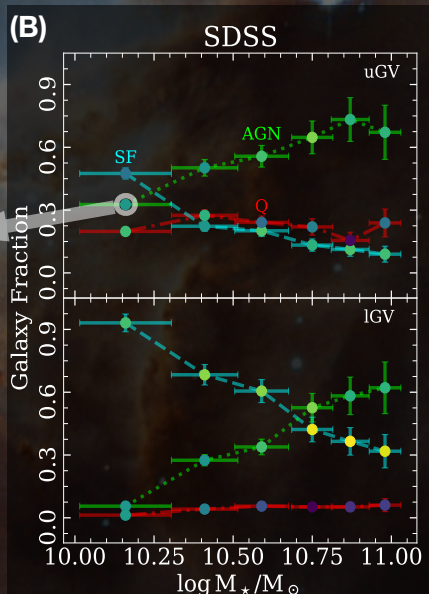
Separate GV into 3 different regions. Select different galaxies for SDSS and EAGLE in upper GV (red bar), uGV, and lower GV (blue bar), lGV.

Colour bar shows level of fractional difference between observation and simulation.

Star Forming



Generally greater fraction of AGN galaxies in SDSS - AGN important in GV at high mass.



Overproduction of Q galaxies in EAGLE - more significant in high stellar mass.

Quiescent

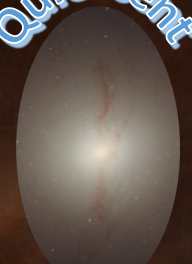


Image: ESA/Hubble